

**Pilates Method Alliance
11th Annual Meeting
Research Platform Presentations
Chair: Sherri R. Betz, PT, GCS, PMA®-CPT
Saturday, November 5, 2011
1:30-2:30pm
Palm Desert, CA**

- 1. Diedre Manns, DPT, PMA®-CPT**
Monarch Wellness Group, Los Angeles, CA
- 2. Lise Stolze, MPT, DSc, CSCS, PMA®-CPT**
Stolze Therapies, Denver, CO
- 3. Karyn Staples, PT, PhD, OCS, PMA®-CPT**
ProHealth Physical Therapy & Pilates, Atlanta, GA
- 4. Jennifer Wells McCauley, DPT, PMA®-CPT**
Harbor City Kaiser Permanente, Wilmington, CA
- 5. Suzanne Martin, PT, DPT, PMA®-CPT**
Pilates Therapeutics LLC, Alameda, CA
- 6. Heidi Wildy, MS**
Arizona State University, Tempe, AZ

CASE REPORT: UTILIZING PILATES AS THE PRIMARY INTERVENTION TO FACILITATE BALANCE INTEGRATION AND POSTURAL CONTROL IN AN ELDERLY PATIENT WITH SENSORY PERIPHERAL NEUROPATHY

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PURPOSE: Provide a functional exercise regimen utilizing standing Pilates exercises to facilitate postural control and improve balance strategies in an older adult with peripheral sensory-motor deficits.

FOUNDATION: The Center of Disease Control and Prevention has reported that one third of adults aged sixty-five or older will fall at least once in a year. Of these falls, 30%-60% will result in moderate to severe injuries that impact the person's independence and increase their chances of early death. Additional studies have reported the cost of falls in adults aged 65 and older exceeded 19 billion dollars in 2000, with expectations of costs to exceed 55 billion by 2020. Fall prevention programs have been an area of active research over the last decade. The evidence indicates that programs with a multi-dimensional approach including exercises targeting balance, strength and endurance to be most effective in preventing falls.

DESCRIPTION: The patient is a 67 y/o male with a 2 year history of idiopathic mixed sensory-motor peripheral neuropathy. Upon evaluation he subjectively reported frequent falls, occurring once monthly on average. The patient participated in thirteen physical therapy sessions (10 weeks) whose primary interventions included standing Pilates Cadillac and Reformer exercises whose intended purpose, by the examiner, was to challenge his limits of stability (LOS) thereby impacting his postural control and LOS.

In order to provide challenges to his sensory-motor and postural control systems, neuromuscular re-education and motor learning strategies were used to facilitate sensory integration. Adjustments to his internal and external environments, external feedback schedules, levels of assistance and resistance provided by the physical therapist and equipment were modified as his performance improved. The outcome measures used in this study were the modified Timed Get Up and Go (TGUG), Functional Reach Test (FRT), tandem walking and static Rhomberg stance.

OBSERVATIONS: The patient demonstrated significant improvements in all balance outcome measures including; the modified TGUG, FRT, tandem walking and static Rhomberg stance. When these outcomes were compared to the normal aged matched values, the patients' scores indicated that he was a minimal to no fall risk. These same outcome measures were performed during one and eight month follow-up sessions, where test measures indicated that he remained a minimal to no fall risk. Additionally the patient had no subjective reports of falls at these one and eight month follow up sessions.

CONCLUSION: Standing Pilates exercises can be utilized as an effective tool to regain balance and postural control in community dwelling elderly adults. A case series or an investigational study with larger sample sizes of aged matched individuals who have been identified as high fall risks could provide greater statistical significance to these current findings.

DERIVATION OF A CLINICAL PREDICTION RULE FOR IDENTIFYING A SUB-GROUP OF PATIENTS WITH LOW BACK PAIN LIKELY TO BENEFIT FROM PILATES EXERCISE

AUTHORS:

- Lise R. Stolze, MPT, DSc. Physical Therapist, Steadman Hawkins Clinic Denver, Greenwood Village, Colorado and Affiliate Faculty Member, Regis University, Denver, Colorado.
- Stephen C. Allison, PT, PhD. Professor, Rocky Mountain University of Health Professions, Provo, UT, and Associate Professor, Baylor University, Waco, TX.
- John D. Childs PT, PhD, MBA. Associate Professor and Director of Research, US Army-Baylor University Doctoral Program in Physical Therapy, San Antonio, Texas.

PRESENTER: Lise Stolze, MPT, DSc; Stolze Therapies, Denver, CO lise@stolzetherapies.com

STUDY DESIGN: Prospective cohort study of subjects with non-specific low back pain (LBP)

OBJECTIVE: The purpose of this study was to derive a preliminary clinical prediction rule for identifying a sub-group of patients with LBP likely to benefit from Pilates exercise therapy.

BACKGROUND: Pilates has been shown to be effective for patients with LBP, however no work has previously been done to characterize patient attributes for those most likely to have a successful outcome from treatment.

METHODS: Treatment response was categorized based on changes in the Oswestry Disability Questionnaire Scores (ODQ) after 8 weeks. An improvement of 50% or greater was categorized as achieving a successful outcome. Thirty seven variables measured at baseline were analyzed with univariate and multivariate methods to derive a clinical prediction rule for successful outcome with Pilates exercise. Accuracy statistics, ROC curves and regression analyses were used to determine the association between standardized examination variables and treatment response status.

RESULTS: 96 subjects participated; 95 completed the study. 51 subjects (53.7%) achieved a successful outcome. A preliminary clinical prediction rule with 5 variables was identified: total trunk flexion ROM < 70 degrees, duration of current symptoms < 6 months, no leg symptoms in the last week, BMI > 25, and left or right hip average rotation < 25 degrees. If any 3 of the 5 attributes were present (positive likelihood ratio 10.64), the probability of experiencing a successful outcome increased from 54% to 93%.

Conclusion: These data provide preliminary evidence to suggest that the response to Pilates exercise therapy in patients with LBP can be predicted from variables collected from the clinical examination. If subsequently validated in a randomized clinical trial, this prediction rule may be useful to improve clinical decision-making in determining which patients are most likely to benefit from Pilates exercise therapy.

PUBLISHED: Stolze LR et al. (2012) Derivation of a Preliminary Clinical Prediction Rule for Identifying a Subgroup of Patients With Low Back Pain Likely to Benefit from Pilates-Based Exercise. *J Ortho Sport Phys Ther.* May; 42(5):425-36

EFFECT OF PERFORMING THE STANDING PILATES REPERTOIRE ON BALANCE IN AN AGING FEMALE POPULATION

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STUDY DESIGN: Single, blinded randomized control trial

OBJECTIVE: To determine if performing the Standing Pilates repertoire would significantly improve balance as determined by the Timed Up and Go (TUG) and Berg Balance Scale (BBS) for women aged 65-85 years

BACKGROUND: The ability to balance directly affects an individual's capacity to function independently or with confidence. As an individual ages, balance is of particular concern for the individual as well as for family members as it impacts that individual's freedom and independence. Poor balance can lead to injury, which may further compromise independence, making balance not just an immediate safety concern, but a broader quality of life issue.

METHODS: Fifty-two community dwelling women were assessed using the Modified Falls Efficacy Scale (MFES), TUG and BBS and then randomly assigned to either the Standing Pilates group (intervention group) or the exercise group (standard group). All participants attended three 45 minute exercise sessions each week for a 4-week time period (12 sessions total).

RESULTS: Forty-one women completed a minimum of 10 exercise sessions and participated in the post-assessment. The MFES tool showed no difference pre and post-assessment and no difference between groups. Statistical significance ($p < 0.05$) was found on the pre- and post-assessment for all participants independent of group assignment on the TUG and BBS. There was no difference between groups on the TUG and BBS. Statistical significance ($p < 0.05$) was found pre- and post-assessment as well as between groups on the abdominal circumference measurement.

CONCLUSIONS: Both groups improved significantly on the TUG and BBS from the pre-assessment to the post-assessment. The Standing Pilates repertoire, however, was no more effective at improving balance scores than the standard group.

KEY WORDS: Pilates, Balance, Female, Aging

THE EFFECT OF A REFORMER-BASED PILATES PROGRAM ON STRESS URINARY INCONTINENCE

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PRESENTER: Jennifer Wells McCauley, DPT, Harbor City Kaiser Permanente, Willmington, CA, jenniferwellsdpt@yahoo.com

STUDY DESIGN: A Single-Subject AB Research Design was chosen to determine the effect of Pilates treatment on SUI. The AB design includes a baseline phase (A) followed by an intervention phase (B).

OBJECTIVES: To establish the potential for Pilates reformer exercises as a treatment for SUI and begin the development of a Pilates exercise protocol for the rehabilitation of SUI.

BACKGROUND: Stress Urinary Incontinence (SUI) is a socially and physically limiting condition, which affects 15-25 million Americans, women more than men. There are several conservative treatment options for SUI that vary in clinical efficacy. It is important to develop additional treatment options to address the unmet needs of this population.

METHODS: Subjects were obtained through a convenience sample and included 3 women age 35-60 with a medical diagnosis of SUI. Each subject participated in 4-week baseline phase followed by an 8-week intervention phase. The dependent variables measured during the baseline and intervention phases were the Urogential Distress Inventory (UDI), bladder diary, cough test, bilateral adductor length and strength, gluteus maximus strength, Laycock manual muscle test (MMT), biofeedback resting tone, average work phase, and maximum contraction. During the intervention phase subjects received a Pilates reformer-based exercise program.

RESULTS: Baseline and intervention phase data were graphed and visually inspected for changes in stability and trend between phases. Two out of 3 participants displayed a downward trend for the UDI-6 indicating decreased leakage during physical activity, coughing, or sneezing. All three subjects displayed a downward trend on the bladder diary indicating a decrease in leakage throughout the intervention. Improvement on pelvic floor muscle endurance and coordination also occurred as indicated by the Laycock MMT. Biofeedback indicated improvement in resting pelvic floor muscle tone. There were no significant changes in adductor length as measured by goniometry or adductor and gluteus maximus strength as measured by MMT.

CONCLUSION: This study found that the reformer-based Pilates method has good potential as a conservative treatment option in the management of SUI. Further research should include larger sample sizes, a more diverse subject population, and long-term follow-up.

CASE REPORT: USING THE PILATES METHOD ENVIRONMENT IN A CASE OF AN ADOLESCENT MALE RECEIVING ONGOING TREATMENT FOR PECTUS EXCURVATUM UTILIZING A SUB-STERNAL 'NUSS' BAR.

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PURPOSE: Pectus excavatum, or 'funnel chest' is a congenital abnormal development of the ribcage, where the sternum sinks, and causes the ribs to depress on one side. Often accompanied by scoliosis, its presentation is fairly common, affecting mostly white males in an occurrence of 1 in every 300-400 births, and accounting for 90% of chest wall deformities. The condition is not merely cosmetic. It can impact the functioning of the heart and lungs. One procedure used in the adolescent population to lessen the impact of the deformity is the Nuss procedure which involves inserting a bar substernally. The bar provides pressure out against the sternum. The goal is to leave the bar in place for a number of years to encourage musculoskeletal re-shaping. This case report documents the use of the Pilates Method apparatus in the first few months of Nuss bar insertion in a 14 year-old with minor scoliosis and a profound pectus excavatum. No standard physical therapy is recorded for this population. The purpose of this case is to highlight the ability of the Pilates Method to be safely used in conjunction with skilled intervention for posture and motor control re-education, as well as muscle balancing during a delicate process. The case encourages further investigation in order to help other adolescents being treated for this condition.

BACKGROUND: The foundation of the case rests upon prior success of conservative treatments involving posture and motor control re-education and muscle balancing found within BioMed Central and in SOSORT (Society of Scoliosis Rehabilitation and Treatment) websites.

DESCRIPTION: The case describes the adolescent's condition pre-Nuss-procedure, and documents three months after Nuss bar insertion. Specific stages of involvement in terms of complications, pain control, function and physical progression are detailed.

OBSERVATIONS: Observations indicate a positive progression toward increased physical tolerance in the Pilates environment, increased coping skills and function management.

CONCLUSIONS: Treatment within the Pilates environment along with skilled intervention holds promise for adolescents undergoing a Nuss procedure to address pectus excavatum.

FUNDING SOURCE: The author is self-funded and has no outside funding source.

REFERENCES:

1. http://my.clevelandclinic.org/disorders/pectus_excavatum/hic_pectus_excavatum.aspx
2. Fonkalsrud, EW. Current management of pectus excavatum. World Journal of Surgery, May 2003. 27(5):502-8.
3. <http://www.biomedcentral.com/> and <http://www.sosort-lyon.net/>

THE EFFECTS OF A PILATES EXERCISE INTERVENTION ON LOW BACK PAIN AND DISABILITY

AUTHOR: Heidi Wildy, MS, Arizona State University, Tempe, AZ, U.S.A., balancefitness@q.com

PURPOSE: The purpose of this study was to examine the effects of a Pilates exercise intervention that incorporates spinal segmental stabilization (SSS) on self-reported low back pain (LBP) and disability.

SUBJECTS: Eighteen participants with chronic recurrent LBP were randomly assigned to a Pilates exercise intervention that included SSS or a control group (traditional methods of care).

METHODS AND MATERIALS: The McGill Pain Questionnaire (short form) and the Oswestry Disability Questionnaire were administered before and after the 8-week intervention period in order to measure changes in self-reported LBP and disability respectively.

ANALYSIS: Independent t-tests and repeated measures analysis of variance were used to assess changes in LBP and disability and differences between the Pilates exercise and the control groups.

RESULTS: Both the Pilates exercise group and the control group had significant reductions in self-reported low back pain and disability at the end of the 8-week intervention. No significant differences were found between the groups.

CONCLUSIONS: This study shows that a Pilates exercise intervention is as effective as traditional methods of care in reducing LBP and disability.

FUNDING SOURCE: None